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Conference Abstract

Brazilian Network on Plant-Pollinator Interactions: an update on the initiative of a standard for plant-pollinator interactions data

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Abstract

The Brazilian Plant-Pollinator Interactions Network*1 (REBIPP) aims to develop scientific and teaching activities in plant-pollinator interaction. The main goals of the network are to:

1. generate a diagnosis of plant-pollinator interactions in Brazil;
2. integrate knowledge in pollination of natural, agricultural, urban and restored areas;
3. identify knowledge gaps;
4. support public policy guidelines aimed at the conservation of biodiversity and ecosystem services for pollination and food production;
5. and encourage collaborative studies among REBIPP participants.

To achieve these goals the group has resumed and built on previous works in data standard definition done under the auspices of the IABIN-PTN (Etienne Américo et al. 2007) and FAO (Saraiva et al. 2010) projects (Saraiva et al. 2017). The ultimate goal is to standardize the ways data on plant-pollinator interactions are digitized, to facilitate data

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sharing and aggregation. A database will be built with standardized data from Brazilian researchers members of the network to be used by the national community, and to allow sharing data with data aggregators.

To achieve those goals three task groups of specialists with similar interests and background (e.g botanists, zoologists, pollination biologists) have been created. Each group is working on the definition of the terms to describe plants, pollinators and their interactions. The glossary created explains their meaning, trying to map the suggested terms into Darwin Core (DwC) terms, and following the TDWG Standards Documentation Standard*2 in definition.

Reaching a consensus on terms and their meaning among members of each group is challenging, since researchers have different views and concerns about which data are important to be included into a standard. That reflects the variety of research questions that underlie different projects and the data they collect. Thus, we ended up having a long list of terms, many of them useful only in very specialized research protocols and experiments, sometimes rarely collected or measured.

Nevertheless we opted to maintain a very comprehensive set of terms, so that a large number of researchers feel that the standard meets their needs and that the databases based on it are a suitable place to store their data, thus encouraging the adoption of the data standard.

An update of the work will soon be available at REBIPP website and will be open for comments and contributions. This proposal of a data standard is also being discussed within the TDWG Biological Interaction Data Interest Group*3 in order to propose an international standard for species interaction data.

The importance of interaction data for guiding conservation practices and ecosystem services provision management has led to the proposal of defining Essential Biodiversity Variables (EBVs) related to biological interactions. Essential Biodiversity Variables (Pereira et al. 2013) were developed to identify key measurements that are required to monitoring biodiversity change. EBVs act as intermediate abstract layer between primary observations (raw data) and indicators (Niemeijer 2002). Five EBV classes have been defined in an initial stage: genetic composition, species populations, species traits, community composition, ecosystem function and ecosystem structure. Each EBV class defines a list of candidate EBVs for biodiversity change monitoring (Fig. 1). Consequently, digitalization of such data and making them available online are essential. Differences in sampling protocols may affect data scalability across space and time, hence imposing barriers to the full use of primary data and EBVs calculation (Henry et al. 2008). Thus, common protocols and methods should be adopted as the most straightforward approach to promote integration of collected data and to allow calculation of EBVs (Jürgens et al. 2011). Recently a Workshop was held by GLOBIS B*4 (GLOBal Infrastructures for Supporting Biodiversity research) to discuss Species Interactions EBVs (February, 26-28, Bari, Italy). Plant-pollinator interactions deserved a lot of attention and REBIPP's work was presented there. As an outcome we expect to define specific EBVs for interactions, and use plant-

pollinators as an example, considering pairwise interactions as well as interaction network related variables.

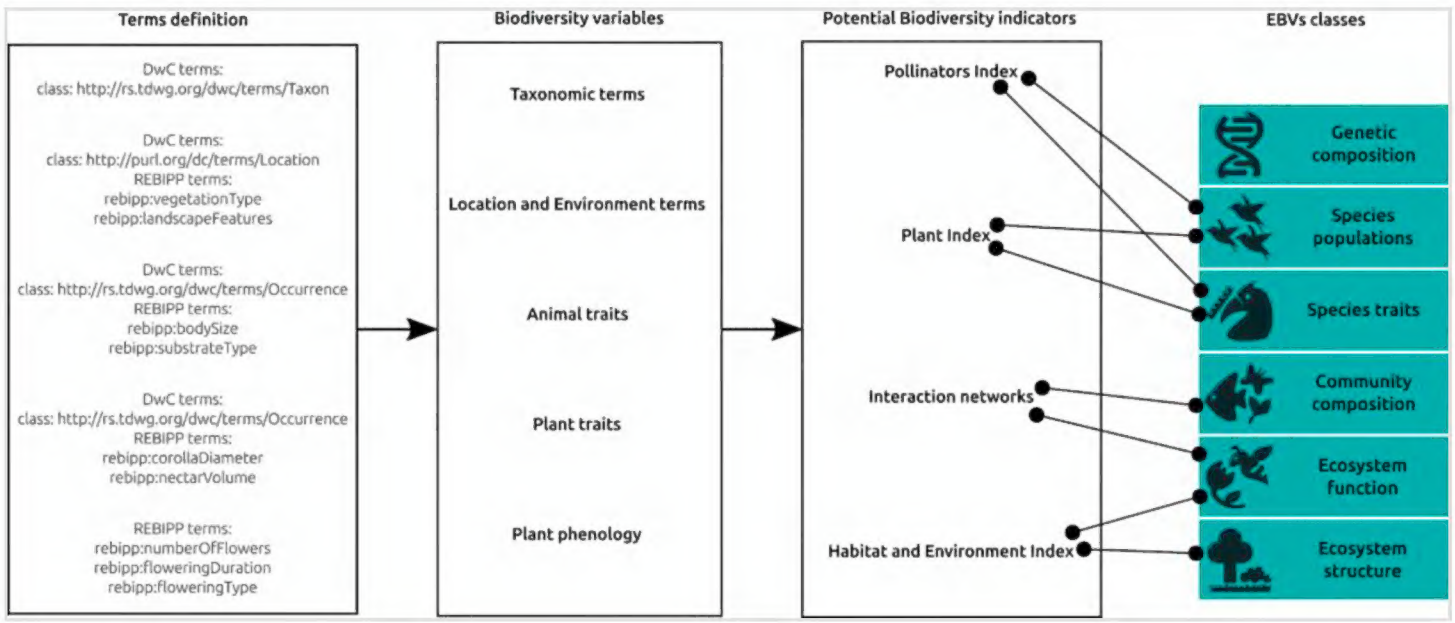

Figure 1.

Mapping of data standard terms to EBVs: terms can be mapped to respective biodiversity variables which potentially could be used to create biodiversity indicators for five EBVs classes.

The terms in the plant-pollinator data standard under discussion at REBIPP will provide information not only on EBV related with interactions, but also on other four EBV classes: species populations, species traits, community composition, ecosystem function and ecosystem structure. As we said, some EBVs for specific ecosystem functions (e.g. pollination) lay beyond interactions network structures. The EBV 'Species interactions' (EBV class 'Community composition') should incorporate other aspects such as frequency (Vázquez et al. 2005), duration and empirical estimates of interaction strengths (Berlow et al. 2004).

Overall, we think the proposed plant-pollinator interaction data standard which is currently being developed by REBIPP will contribute to data aggregation, filling many data gaps and can also provide indicators for long-term monitoring, being an essential source of data for EBVs.

Keywords

plant-pollinator interaction, data standard, biological interactions data

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Endnotes

*1 http://www.rebipp.org.br

*2 http://www.tdwg.org/standards/147

*3 https://github.com/tdwg/interaction

*4 http://www.globis-b.eu/news/15/4th_globis-b_workshop_on_species_interactions_ebv.html